

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A communication network designing circuit for multiple point communication service for permitting arbitrary communication within a predetermined range by providing a traffic ~~amount of data inflowing flowing in~~ from an ingress node through which data flows in from an other network and a traffic ~~amount of data~~ flowing out from an egress node through which data is fed to ~~the~~ other network, ~~in an object network consisted of a plurality of nodes and connected to other network~~, comprising:

setting means for setting a mathematical programming problem for deriving said multiple point communication service to permit arbitrary communication within the predetermined range; and

optimizing means for solving the mathematical programming problem set by said setting means and obtaining a path for said multiple point communication service.

2. (Currently Amended) [[A]] The communication network designing circuit as set forth in claim 1, wherein said path for said multiple point communication service is derived on the basis of a preliminarily set optimization standard.

3. (Currently Amended) [[A]] The communication network designing circuit as set forth in claim 1, wherein said setting means comprises:

optimization reference generating means for setting an objective function for minimizing a link load in said an object network coupled to the other network and serving as an optimization reference and setting a constraint expression for deriving said link load;

route selecting condition generating means for generating a constraint expression for selecting a route for including traffic ~~of data inflowing~~ flowing in from the other network;

per-user necessary link capacity calculating condition generating means for generating a constraint expression for calculating a necessary link bandwidth for each link carrying traffic flowing in band of each link ~~per traffic of data inflowing~~ from each ingress node; and

link including condition generating means for generating a constraint expression so as not to exceed a link capacity limit in each link.

4. (Currently Amended) [[A]] The communication network designing circuit as set forth in claim 3, wherein the optimization reference generating means, the route selecting condition generating means, the per-user necessary link capacity calculating condition generating means, and the link including condition generating means each means in said setting means performs on process operate in parallel relative with respect to each other.

5. (Currently Amended) A communication network designing method for multiple point communication service for permitting arbitrary communication within a predetermined range by providing ~~a traffic amount of data inflowing~~ traffic flowing in from an ingress node through which data flows in from an other network and ~~a traffic amount of data~~ flowing out from an egress node through which data is fed to the other network, ~~in an object network consisted of a~~

~~plurality of nodes and connected to other network~~, comprising:

~~setting step~~ of setting a mathematical programming problem for deriving said multiple point communication service to provide arbitrary communication within the predetermined range; and

~~optimizing step~~ of solving the mathematical programming problem set ~~in~~ by said setting; step and

obtaining a path for said multiple point communication service.

6. (Currently Amended) [[A]] The communication network designing method as set forth in claim 5, wherein said path for said multiple point communication service is derived on the basis of a preliminarily set optimization standard.

7. (Currently Amended) [[A]] The communication network designing method as set forth in claim 5, wherein said setting step comprises:

~~optimization reference generating step~~ of setting an objective function for minimizing a link load in ~~said~~ an object network operatively coupled to the other network and where the objective function serves serving as an optimization reference; and

setting a constraint expression for deriving said link load;

~~route selecting condition generating step~~ of generating a constraint expression for selecting a route for including traffic of data flowing in from the other network;

~~per ser necessary link capacity calculating condition generating step~~ of generating a constraint expression for calculating a necessary link bandwidth of each link per traffic of data

inflowing carrying traffic flowing in from each ingress node; and

link including condition generating step of generating a constraint expression so as not to exceed a link capacity limit in each link.

8. (Currently Amended) [[A]] The communication network designing method as set forth in claim 7, wherein each sub step in said setting step performs on process the setting an objective function, the setting a constraint expression, the generating a constraint expression for selecting, the generating a constraint expression for calculating, and the generating a constraint expression so as not to exceed a link capacity limit in each link operate in parallel relative with respect to each other.

9. (Currently Amended) A storage medium storing a communication network design control program for designing a communication network for multiple point communication service for permitting arbitrary communication within a predetermined range by providing a traffic ~~amount of data inflowing flowing in~~ from an ingress node through which data flows in from ~~an~~ other network and a traffic ~~amount of data~~ flowing out from an egress node through which data is fed to ~~the other network, in an object network consisted of a plurality of nodes and connected to other network~~, said communication network design control program comprising:

~~setting step of operating a computer for setting a mathematical programming problem for deriving said multiple point communication service to provide arbitrary communication within the predetermined range; and~~

~~optimizing step of operating said computer for solving the mathematical programming~~

problem set in said setting step; and

obtaining a path for said multiple point communication service.

10. (Currently Amended) [[A]] The storage medium as set forth in claim 9, further comprising:
~~wherein said communication network design control program operates said computer for~~
deriving said path for said multiple point communication service on the basis of a
preliminarily set optimization standard.

11. (Currently Amended) [[A]] The storage medium as set forth in claim 9, wherein said setting
~~step in said communication network design control program further comprises:~~

~~optimization reference generating step of operating said computer for setting an objective~~
function for minimizing a link load ~~in said object network and serving in cooperation with an~~
objective function that serves as an optimization reference; and

setting a constraint expression for deriving said link load;

~~route selecting condition generating step of operating said computer for generating a~~
constraint expression for selecting a route for including traffic ~~of data inflowing flowing in~~ from
the other network;

~~per se necessary link capacity calculating condition generating step of operating said~~
~~computer for generating a constraint expression for calculating a necessary link bandwidth of~~
each link per carrying traffic of data inflowing flowing in from each ingress node; and

~~link including condition generating step of operating said computer for generating a~~
constraint expression so as not to exceed a link capacity limit in each link.

12. (Currently Amended) [[A]] The storage medium as set forth in claim 11, wherein each sub-step in said setting step performs on process the minimizing a link load, the setting a constraint expression, the generating a constraint expression for selecting a route, the generating a constraint expression for calculating a necessary link bandwidth, and the generating a constraint expression operate in parallel relative with respect to each other.

13. (Currently Amended) A transmission medium transmitting a communication network design control program for designing a communication network for multiple point communication service for permitting arbitrary communication within a predetermined range by providing a traffic amount of data inflowing flowing in from an ingress node through which data flows in from an other network and a traffic amount of data flowing flows out from an egress node through which data is fed to the other network, in an object network consisted of a plurality of nodes and connected to other network, said communication network design control program comprising:

setting step of operating a computer for setting a mathematical programming problem for deriving said multiple point communication service to provide arbitrary communication within the predetermined range; and

optimizing step of operating said computer for solving the mathematical programming problem set in said setting step; and

obtaining a path for said multiple point communication service.

14. (Currently Amended) [[A]] The transmission medium as set forth in claim 13, wherein said communication network design control program operates said computer for deriving obtaining said path for said multiple point communication service on the basis of a preliminarily set optimization standard.

15. (Currently Amended) [[A]] The transmission medium as set forth in claim 13, wherein said setting step in said communication network design control program comprises:

~~optimization reference generating step of operating said computer for setting an objective function for minimizing a link load in said an object network and serving as an optimization reference; and~~

setting a constraint expression for deriving said link load;

~~route selecting condition generating step of operating said computer for generating a constraint expression for selecting a route for including traffic of data flowing in from the other network;~~

~~per ser necessary link capacity calculating condition generating step of operating said computer for generating a constraint expression for calculating a necessary link bandwidth of each link per carrying traffic of data inflowing flowing in from each ingress node; and~~

~~link including condition generating step of operating said computer for generating a constraint expression so as not to exceed a link capacity limit in each link.~~

16. (Currently Amended) [[A]] The transmission medium as set forth in claim 15, wherein the setting an objective function, the generating a constraint expression, the operating said computer

for generating a constraint expression for calculating a necessary link bandwidth, and the
operating said computer for generating a constraint expression so as not to exceed a link capacity
limit in each link-each sub step in said setting step performs on process operate in parallel
relative with respect to each other.